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but a native explained them as cartographical delineations, intended to indicate the locality where the utensil was manufactured, and the position and relative distances from it of the other villages occupied by the tribe.

This explanation seems to have valuable bearings in the interpretation of petroglyphs, and also of some of the curious markings on aboriginal pottery. It is likely that the same idea would be carried out on the soft surface of the pottery jar as on the exterior of the gourd. Some similar drawings of a topographic nature have been briefly discussed by Col. Garrick Mallery in his 'Picture Writings of the American Indians,' p. 341.

D. G. BRINTON.

SCIENTIFIC NOTES AND NEWS.

ASTRONOMY.

THE international committee having in charge the work of the Astrophotographic Chart of the Heavens met in Paris on May 11th and the following days. The proceedings of the committee related principally to the technical details of the work. The reports of the directors of the various observatories taking part in the photographic work were, however, of considerable public interest. It appears from these reports that the series of plates from the measurement of which a catalogue of all the stars down to the eleventh magnitude is to be constructed have been practically completed at nearly all the participating observatories. The second series of plates, which are to be used simply as a chart, and which will include stars several magnitudes fainter than the smallest ones admitted to the great catalogue, is also well advanced. These chart plates require a much longer exposure than the catalogue plates, and for this reason it is not possible to finish them as quickly as the others.

The measurement of the catalogue plates has progressed with satisfactory rapidity at several of the observatories, so that we may expect the first instalment of the catalogue within a very few years. The final completion of it will perhaps require twenty-five or thirty years. The

probable error of the final catalogue positions will be about one-tenth of a second of arc in either coördinate.

H. J.

THE MISSOURI BOTANICAL GARDEN.

THE seventh annual report of the Missouri Botanical Garden, recently issued, contains, in addition to the scientific papers, which we hope to notice later, the administrative reports for the year 1895. From these it appears that during the past year the maintenance revenue of the institution was \$100,042.65, of which \$86,698.09 was expended for the maintenance of the revenue property, taxes (amounting to nearly \$25,000.00), and the maintenance and extension of the Garden.

It is stated that about one-third more people visited the Garden than during the previous year, on one day over 30,000 persons having been counted. As in the two preceding seasons, the growth of the *Victoria Regia* was made a prominent feature, and excited much interest. One of the most practical and direct benefits conferred by the Garden is indicated by the statement that, as in previous years, a considerable number of bedding plants were removed from the ground and potted on the approach of cold weather, and about 800 of these were distributed to hospitals, mission schools and similar charities, about half of the number going to the kindergartens of the public-school system. The provision for experimental work in horticulture and for the adequate instruction of pupils in gardening has been increased by the planting of a carefully selected orchard and the erection of a vegetable forcing house, built on the approved commercial models.

The herbarium has been increased by the incorporation of over ten thousand sheets of specimens, and now comprises some 242,000 specimens, besides over 4,000 slides, wood specimens, etc. During the past year, \$3,764.00 was spent for purchases and binding for the library, which has been increased by 3,036 books and pamphlets during the year, so that, as now constituted, it consists of 10,030 pamphlets and 9,619 volumes. These facilities have been placed freely at the service of competent investigators, in a circular similar to one that was printed in this JOURNAL a year since, and they have been used,

as far as possible, in the botanical instruction of students in the School of Botany, of Washington University.

AGRICULTURE IN GREAT BRITAIN.

THE report of the British Board of Agriculture for 1895 is summarized in a recent issue of the New York *Evening Post*. It appears that the extent of woodlands in Great Britain is 2,726,000 acres, of which 132,000 acres have been planted in the last fifteen years. During the last year there has been a gain of about 30,000 acres. The most striking figures relate to the shrinkage in the amount of land under the plough, which was increased by the unpropitious character of the autumn seed time of 1894 and early spring of 1895. More than 510,000 acres less of wheat were grown, and 57,000 acres less of minor grain crops, rye, beans and peas. One-fifth part of the surface withdrawn from these crops or from wheat was devoted to barley and oats; but the corn land of 1895 was less by nearly 455,000 acres than that of 1894, while weather conditions, checking the preparation of the customary area for turnips and other green crops, caused a further reduction of 112,000 acres under this cultivation. The surface under potatoes, small fruit, lucerne and flax was larger by 45,000 acres, and the acreage left under bare fallow was extended by nearly 100,000 acres. The net reduction of arable land was 197,000 acres, and the net addition to the permanent pasture a little over 145,000 acres. The actual loss of arable area in the last two decades is 2,137,000 acres. The reduction of wheat-growing alone accounts for most of this loss. Under this head there was a total diminution of more than 1,900,000 acres between 1875 and 1895. More than a third of the decline in the arable area, and more than half of this reduction in wheat acreage, occurred in the last five years of the twenty. Statistics are given also of the imports of agricultural produce during the last twenty years. In value, the totals for 1895 exhibit increased imports of dead meat, poultry, eggs and lard. Live animals and dairy produce show slightly lower total values. Wheat and flour importations during the year amounted to more than £30,000,000, as against £26,755,000 in 1894, while

other grain imports were reduced. The value of live animals imported represented £8,966,000, as against a total of £9,090,000 in 1894. The average animal importations has been more than £8,500,000 for the last ten years.

GENERAL.

DR. DAVID STARR JORDAN, President of Stanford University, has been appointed President of the Sealing Commission, which will go to Alaska on the steamer Albatross to study the sealing question. Drs. Leonhard Stegner and F. A. Lucas, of the Smithsonian Institution, will accompany him. On the part of the government of the Dominion of Canada Mr. Andrew Hackett of the Fisheries Department, Professor MacGoun of the Geological Survey, and Professor Darcy Thompson, of Dundee, have left for British Columbia, on the way to Bering Sea.

THE expedition of M. Andrée embarked on June 6th from Gothenburg for Spitzbergen, from which place the expedition will proceed in the balloon.

LIEUTENANT PEARY, before starting on his expedition to the north coast of Greenland, has gone to England, his main purpose being to present an account of his important explorations in northern Greenland to the Royal Geographical Society.

M^{LE}. KLUMPKE, known for her work at the Paris Observatory, has been elected a member of the British Astronomical Association.

DR. LEOPOLD DIPPEL, director of the Botanical Gardens at Darmstadt, and professor of botany in the Technical High School, has retired.

A VALUABLE collection of animals and birds of Palestine, and of Roman coins, is offered for sale by Dr. Selah Merrill, of Andover (for many years United States Consul at Jerusalem).

THE Council of the British Medical Association has received an invitation to meet at Montreal in 1897.

THE *Lancet* states that a surgeon in the United States navy reports that in Japan among 1200 soldiers 1.58 per cent. were red blind, and 0.833 per cent. green blind. Among 373 boys 1 per cent. were red blind, and among 270 girls 0.4 per cent. Among 596 men in Kyoto 5.45

showed defective color sense. Dr. Fielde, of Swatow, China, examined 1200 Chinese of both sexes, using Thompson's wool tests. Among the 600 men were 19 who were color-blind, and among 600 women only 1. The percentage of color-blindness among Chinamen is then about 3 per cent., and does not vary greatly from that in Europeans. Dr. Fielde, however, found that fully half of those tested mixed up blue and green, and this investigator thinks that many of the race are quite blind to the violet colors.

THE thirty-first field meeting of the Appalachian Mountain Club will be held from July 3 to July 11, 1896, in the Crawford House, N. H. Sessions for the reading of papers and discussions will be arranged for evenings and for stormy days. Excursions will be made to the summit of Mount Washington and to Carrigain, Webster, Willard, Willey, Avalon, and other mountains, and possibly up the Mt. Washington river valley.

MR. E. WALTER MAUNDER, the astronomical editor of *Knowledge*, has arranged to visit Norway on board the steamship 'Norse King,' to observe the total eclipse of the sun on the 9th of August next.

THE recent tornado in St. Louis destroyed or seriously injured over 400 trees in the Missouri Botanical Garden, and several of the buildings were damaged; fortunately no harm was done to the herbarium and library. Shortly before the tornado 6,000 panes of glass were broken by a hail storm.

A PRIZE of \$50 is offered by the editor of the *Bulletins of American Paleontology*, Prof. G. D. Harris, of Cornell University, for a monograph suitable for publication in the bulletins; it must be presented before May 1, 1897.

THE Société helvétique des sciences naturelles and the affiliated societies will meet at Zurich, from August 2d to 5th.

A BI-MONTHLY mathematical journal to be edited by Prof. W. E. Storey, Clark University, is announced. The first number is now in the press and is expected to appear at once.

THE collection of American historical documents and other *Americana* made by Mr. T. A. Emmet has been presented to the New York Public Library; it is stated that the collection

cost Mr. Emmet \$300,000 and that Mr. J. S. Kennedy paid the collector \$150,000. A friend of Yale University has purchased for the library a collection of 6,000 volumes and 19,000 pamphlets relating to Scandinavia.

A SIXTEENTH section, treating alcoholism, has been added to the Moscow International Medical Congress.

ACCORDING to *The British Medical Journal* the new physiological and pathological laboratories just opened at Queen's College, Belfast, are in every way excellent, and form a valuable addition to the resources of the Belfast Medical School. Dr. Lorrain Smith, lecturer on pathology, is conducting a post-graduate course on bacteriology, which is being largely attended and highly appreciated. The Council of the College, in accordance with the new regulations of the Royal University, have founded a new lectureship in public health. Dr. Whitaker, the General Superintendent Officer of Health for Belfast, has been appointed to the post. The lectures will be extended over three months.

DURING the spring term the class in field geology in Union College, accompanied by Prof. Prosser, has spent every Saturday in studying the different formations and interesting geological structure found within a radius of fifty miles from Schenectady. The formations studied range from the Laurentian up to the Hamilton of the Devonian. Some of the localities examined are the region of Saratoga Springs, and in the Mohawk Valley, Hoffman's, Amsterdam, Tribes Hill and 'the Noses' near Spraker's. At Saratoga, Hoffman's and 'the Noses' are excellent examples of fault structure, the latter place showing the Laurentian, Calciferous, Trenton and Utica formations. To the south of the Mohawk Valley, the eastern and northern flanks of the Helderberg Mountains and Howe's Cave were visited. This region gives an admirable section of the formations represented in eastern New York from the Hudson to near the summit of the Hamilton, and is also the typical locality for a number of them. As a result of this and earlier work of the department, valuable material and data have been obtained that will be used in preparing a report, revising the geology of this region.

SINCE our last issue news has reached us of the death of the eminent English physician, Sir Russell Reynolds, who died at London on May 29th at the age of 68. He was the President of the British Medical Association, and until lately President of the Royal College of Physicians and Professor of the Principles and Practice of Medicine in University College. He made important contributions to the scientific study of diseases of the nervous system, being one of the first to apply the statistical method. He was also the editor of the first 'English System of Medicine,' which appeared in five large volumes between 1866 and 1878.

CAPTAIN JOHN G. BOURKE, United States army, died in Philadelphia on June 8th. He had a brilliant record as a soldier, but deserves mention in this place owing to his contributions to anthropology and folk-lore. He was this year President of the Folk-lore Society. It is also proper to record in this JOURNAL the death of Mr. George Munroe, the New York publisher, not only on account of his generous gifts, which included \$500,000 to Dalhousie College, Halifax, but because he was from 1850 to 1856 instructor in mathematics in the Free Church College, Halifax.

M. DAUBRÉE, the eminent geologist, has died at the age of 82. He was from 1839 to 1855 a professor at Strasburg University, whence he was called to a chair at the School of Mines and the Natural History Museum, Paris.

WE regret that we must record in this issue an unusually large number of deaths of men of science. These include Dr. Finkelnburg, of Bonn, author of important works on hygiene; M. Raulin, professor of industrial and agricultural chemistry in the University of Lyons; Mr. Richard Sims, the antiquarian; Dr. Joseph Alexis Stolz, at the advanced age of 92, a native of Alsace, who was a professor at the Strasburg Faculty of Medicine till 1871, removed with the faculty to Nancy, and retired in 1880; Sir George Johnson, F. R. S., an eminent physician and professor of clinical medicine in King's College, at the age of 78; Dr. Hosius, of Münster, professor of mineralogy, at the age of 70; Professor Schickendantz, the chemist, at Buenos Ayres; Dr. Ludwig Mark, as-

sociate professor of agriculture at Königsburg, at the age of 56, and Dr. Wilhelm Hanke, sometime professor of anatomy at Tübingen, at the age of 62.

Natural Science notes that Mr. G. A. Boulenger is one of the first to use X-rays for purposes of systematic zoölogy, having used a skiagraph to determine the more important points in the skeleton of the rare toad *Pelodytes caucasicus*, the second known species of the genus represented by a single specimen. The skiagraph showed the junction of the astragalus and calcaneum, the form and extent of the frontoparietal fontanelle, the shape of the widely-expanded sacral transverse processes and the direction of those of the lumbar.

THE *Lancet* states that an effort is at present being made to establish a museum in the historic city of Derry, Londonderry, and it is suggested that Gynn's Institution might be let for purpose of a museum at a nominal rent. There is a nucleus of a museum, which was some time ago handed over to Mr. Bernard, and at present the articles are being arranged in suitable cases. They are chiefly minerals. Moreover, several local gentlemen have private collections which would probably be forthcoming if a suitable habitation were obtained. Mr. Bernard, whose stock of relics and curios is a most valuable one, has expressed his willingness to give them to a local museum, and Sir J. A. McCullagh has also a series of relics specially associated with the past history of Derry. It is hoped a building will soon be set apart for the museum.

UNIVERSITY AND EDUCATIONAL NEWS.

It is announced in the daily papers that Sir Donald Smith will build in Montreal a Royal College for women, at a cost of \$2,000,000.

MISS HELEN CULVER has added \$25,000 to the \$1,000,000 she had already given to the University of Chicago. This sum is to be added to the \$300,000 set apart for the erection of four biological buildings.

THE class of 1876 of Princeton University has subscribed \$15,000 towards the endowment of a McCosh professorship of philosophy.